



Via Edgar

January 7, 2011

Jeffrey Riedler, Assistant Director
Securities and Exchange Commission
100 F Street, N.E.
Washington D.C. 20549

Re: Bacterin International Holdings, Inc.
Registration Statement on Form S-1/A
Filed December 7, 2010
File No. 333-169620

Dear Mr. Riedler:

This letter is in response to your comment letter dated December 20, 2010 to our Registration Statement on Form S-1/A filed December 7, 2010 ("Registration Statement"). For your convenience, your questions and comments are restated below in italics, followed by our response. The numbering corresponds with the comments in your letter.

We have concurrently filed via Edgar Amendment No. 2 to our Registration Statement, which includes revisions to our Registration Statement based on your comment letter, as well as other updated information.

Bacterin International Holdings, Inc.. page 1

1. *We note your response to our prior comment 3. However, the word "leader" still appears in the same context on page F-21 of your notes to the financial statements. Please revise your disclosure there to delete the word.*

Response: We have deleted the word leader from page F-21 in the notes to our financial statements.

2. We note your response to our prior comment 4. The statement in the first bullet still appears on page F-21 and the statements in the second and third bullet still appear on page 26. Please delete those statements and confirm that you have deleted these statements elsewhere as applicable.

Response: We have deleted these statements in response to your comment.

Recent Developments, page 1

3. We note your response to prior comment 5. We also note that the private placements through which the selling stockholders acquired the shares being registered are described on page 2 of the filing; however, it still does not appear that the share amounts mentioned add up to the amount being registered through this registration statement. Please revise your disclosure to clarify when, and in what transactions, the entirety of the 11,250,597 shares (including 4,126,630 shares issuable upon the exercise of warrants) were placed with the selling stockholders.

Response: We have revised our disclosure to clarify when, and in what transactions, the entirety of the 11,296,112 shares (including 4,135,733 shares issuable upon the exercise of warrants) were placed with the selling stockholders. In addition, we are providing the following table for your convenience:

	<u>Shares</u>	<u>Warrants</u>	<u>Total</u>
Bridge note warrants	-	1,482,256	1,482,256
Private Placement 6/30/2010			
Cash from Investors	2,516,250	629,063	3,145,313
Note Conversions	2,418,283	604,583	3,022,866
Second closing – 7/30/2010	1,102,500	275,625	1,378,125
Post private placement note conversions	316,823	79,206	396,029
Placement agent - bridge	-	328,125	328,125
Placement agent – private placement	106,217	361,875	468,092
Former executive settlement agreement	30,000	-	30,000
Warrant exercises/replacement warrants	489,710	-	489,710
WTI Financing	-	375,000	375,000
Predecessor company shares	180,596	-	180,596
Total	7,160,379	4,135,733	11,296,112

Risk Factors

Future revenue will depend on our ability to develop new sales channels.... page 6

4. We note your response to prior comment 10 where you included the \$8 million you incurred for sales and marketing expense in 2010. However, we also note that you will continue to expand your sales force in the future. Please expand your disclosure in this risk factor to quantify, to the extent practicable, the amount of funds you will need to further expand your direct sales force. In addition, please quantify your funding requirements and sources of funding in greater detail in the section entitled "Cash Requirements" in your Management's Discussion and Analysis.

Response: We have expanded our disclosure to quantify, to the extent practicable, the amount of funds we will need to further expand our direct sales force, and we have also expanded our disclosure regarding our funding requirements in the section entitled "Cash Requirements" in our Management's Discussion and Analysis.

Results of Operations

Comparison of Nine Months Ended September 30, 2010 and September 30, 2009

Cost of tissue sales, page 18

5. Please revise the discussion you provided in response to comment 16 to explain why you adjusted biologics inventories in the amount of \$669,000 during 2009. In addition, please revise your statement that this inventory adjustment offset the cost increase relating to the higher sales, since both of these factors would increase the cost of sales. Furthermore, please also revise the discussion that is provided on page 20 as applicable.

Response: We have revised our discussion to explain why we adjusted biologics inventories in the amount of \$669,000 in 2009. We have also deleted the statement regarding an offset and we have revised our discussion on page 20.

Change in Warrant Derivative Liability, page 18

6. Please revise your discussion to explain why there was such a significant increase in the value of warrant derivatives during the three months ended September 30, 2010.

Response: We have revised our discussion to explain why there was such a significant increase in the value of warrant derivatives during the three months ended September 30, 2010.

Business, page 23

Overview of Our Business, page 23

7. We note your response to prior comment 18 that you have revised your disclosure to disclose amounts incurred for expansion of your direct sales force and amounts you anticipate that you will need to increase, expand or update your existing facilities over the next five years. To the extent practicable, please disclose the amount of funds you will allocate to the future expansion of your sales force.

Response: We have disclosed the amount of funds we plan to allocate to the future expansion of our sales force.

Products and Services, page 24

8. We note your response to prior comment 22. Please expand your disclosure to clarify that the FDA will have to approve OsteoSponge SC as a cartilage re-generation scaffold before you can start marketing the product for that indication.

Response: We have expanded our disclosure to clarify that the FDA will have to approve OsteoSponge SC as a cartilage re-generation scaffold before we can start marketing the product for that indication.

9. We note your response to prior comment 24. Please revise your disclosure to clarify that the reference to "certain of our products" is a reference to OsteoSponge SC.

Response: We have revised our disclosure to clarify that the reference to "certain of our products" is a reference to OsteoSponge SC.

10. We note your response to prior comment 26 that you do not believe that the contract with RyMed Technologies, Inc. is material to your business or operations. Please provide us with a detailed analysis supporting your belief that the agreement is not material and that you are not substantially dependant on it. For example, please provide information regarding the amount of revenues generated from the agreement with RyMed for the periods covered by your registration statement.

Response: We have not yet generated any revenues from the agreement with RyMed for the periods covered by our registration statement, and for that reason we do not believe the contract with RyMed is material to our business or operations. In addition, at the present time, we do not expect future revenues from the RyMed Agreement to exceed 2% of our total revenue for the foreseeable future.

Financial Statements for the Quarterly Period Ended September 30, 2010

(12) Stock-Based Compensation, page F-11

11. Please tell us how the warrant issuances described in the narrative on page F-13 reconciles to the roll-forward of the warrant activities table. In addition, please revise your disclosure to describe the method you utilized to fair value the warrants and how you accounted for the warrants issued during 2010. If any were accounted for as a derivative, describe the feature that triggered the derivative accounting.

Response: We have revised our disclosure to explain how the warrant issuances described on page F-13 reconcile with the warrant activities table. In addition, we have revised our disclosure to indicate that we used the Black Scholes method to determine the fair market value of the warrants. We have also indicated that the warrants were accounted for as derivatives in connection with the price protection provisions of ASC 815.

Financial Statements for the Year Ended December 31, 2009

(1) Business Description and Summary of Significant Accounting Policies

Grants, page F-22

12. Please revise your disclosure to quantify the amount of grants you provided and received during the periods presented. If no amount was given or received, disclose that fact.

Response: We did not receive any grant revenue for the periods presented.

Revenue Recognition, page F-23

13. We acknowledge your response to comment 29. However, you continue to mention that you earn revenues from licensing on pages 16, 24, and F-5. Please revise your discussions throughout your document to be consistent with your response.

Response: We have deleted our references to licensing revenue as these amounts are less than 2% of total revenue.

(8) Convertible Notes Payable, page F-26

14. Refer to your response to comment 41. While you state that the ratchet provision of the conversion rate helps maintain the clear and close relationship of the risks between the conversion feature and the host contract, it is unclear to us how the market risk that the conversion feature will continue to have, even in the event of a conversion price adjustment, are clearly and closely related to a debt instrument. Furthermore, since the economic characteristic of the embedded instrument is equity (i.e. the host instrument is convertible into an equity instrument), the embedded instrument does not appear to be clearly and closely related to the host instrument (debt). Please provide us a scope analysis under ASC 815-40-15 and ASC 815-40-25 as originally requested in our comment to support your accounting.

Response: ASC 815-40-15 applies to freestanding contracts that are indexed to, and potentially settled in, an entity's own stock. In determining if the conversion feature is indexed to the entity's own stock we referred at ASC 815-40-15-5 which states "the guidance in this paragraph through paragraph 815-40-15-8 applies to any free standing financial instrument or embedded feature that has "all the characteristics of a derivative instrument". This is consistent with ASC 815-15-25-1 which requires that "an embedded derivative shall be separated from the host contract and accounted for as a derivative instrument pursuant to Subtopic 815-10 if and only if all of the following criteria are met: A. The economic characteristics and risks of the embedded derivative are not clearly and closely related to the economic characteristics and risks of the host contract. B. the hybrid instrument is not remeasured at fair value under otherwise applicable GAAP with changes in fair value reported in earnings as they occur. C. A separate instrument with the same terms as the embedded derivative would, pursuant to Section 815-10-15, be a derivative instrument subject to the requirements of this Subtopic." The Company performed the following analysis to see if the embedded conversion option would meet all the characteristics of a derivative instrument if it were a separate instrument.

Per ASC 815-10-15-83, a derivative instrument is a financial instrument or other contract with all three of the following characteristics:

- a. It has one or more underlyings and one or more notional amounts or payment provisions or both. Those terms determine the amount of the settlement or settlements, and, in some cases, whether or not a settlement is required.
- b. It requires no initial net investment or an initial net investment that is smaller than would be required for other types of contracts that would be expected to have a similar response to changes in market factors.
- c. Its terms require or permit net settlement, it can readily be settled net by a means outside the contract, or it provides for delivery of an asset that puts the recipient in a position not substantially different from net settlement.

With respect to c. above:

This part of the definition of a derivative has three parts to it –

- (1) The contract permits or requires net settlement, or
- (2) There is a market mechanism that permits net settlement, or
- (3) Net settlement can be achieved by delivery of an asset that is readily convertible to cash.

The Company believes (a) and (b) of ASC 815-10-15-83 are met and that to meet the characteristics of (c) one of the above three terms needs to be present.

Part (1) means there would be some type of net settlement permitted or required.

Part (2) means there is a (public) market in which the contract could be sold (thus permitting the holder to realize its gain). This would apply, for example, to traded options, where a holder could sell the option contract in the market and realize the gain.

Part (3) applies where, for example, the Company delivers shares on exercise and those shares can then be sold in a public market, thus permitting the holder to realize its gain. The shares delivered on conversion must be “readily convertible to cash” meaning the market must be able to absorb the quantity to be sold within a reasonable time (say a few days to a week), which in part depends on the quantity being sold and the daily market volume.

For the conversion option, there is no cashless net settlement permitted or required so (2) or (3) must be met to make the conversion option meet the definition of a derivative instrument. The conversion option is not publicly traded so (b) is not met. Similarly, there is no (public) market for the shares delivered on conversion, so (c) is not met.

The conversion option embedded in the convertible notes payable is not a derivative instrument as defined in ASC 815-10-15-83 because the conversion option does not permit or require net settlement, there is no market mechanism outside the contract that permits net settlement and the shares to be delivered on conversion are not readily convertible to cash. At the time the convertible notes payable were issued, the Company was private and there had not been any market activity for its common stock. Since June 30, 2010, when the Company became public there has been insufficient trading volume to permit the shares to be delivered on conversion of each note to be readily sold in the market, thus precluding the shares to be received by the holder of each note from being readily convertible to cash.

As of November 30, 2010, all of the Company's convertible notes payable have been repaid or converted to common stock and no amounts under the notes remain outstanding.

Conclusion:

Per the above, the Company has determined that the embedded conversion option does not meet the definition of a derivative instrument and therefore does not fall within the scope of ASC 815-40-15. Separation of the embedded conversion option from the host contract is not required.

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Should you have any questions or comments regarding our responses to your comment letter or Amendment No. 2 to our Registration Statement, please do not hesitate to call me at (406) 388-0480.

Very truly yours,

Bacterin International Holdings, Inc.

By: /s/ John P. Gandolfo

Name: John P. Gandolfo

Title: Chief Financial Officer